# HPCMP REQUEST FOR QUOTES

4TJM-03-1000

The Department of Defense (DoD) High Performance Computing Modernization Program (HPCMP) is seeking initial quotes for a uniform range of HPC configurations and associated maintenance against GSA Schedule 70 contracts to address the non-real time HPC requirements for its user base of scientists and engineers across the HPCMP Major Shared Resource Centers (MSRCs). Information obtained from these initial quotes will be used in conjunction with benchmark performance data obtained from this Request for Quotes (RFQ) from potential offerors to determine solutions to address HPCMP user requirements. No awards will be made from the initial RFQ. On approximately 26 Sep 2003, a final RFQ for one or more specific system configurations across one or more specific MSRCs against existing GSA Schedule 70 contracts will be sought. General information is provided below and in the attachments to give offerors a better understanding of terms and conditions which may be required for systems and services acquired. (Attachments 1, 2 and 3, Terms and Conditions, Acceptance Testing, and Warranty and Maintenance generally reflect the Program's expectations, but are draft documents and may be changed when the second phase of this procurement is released). The Government reserves the right to not make an award from the final RFQ.

## INFORMATION REQUIRED IN INITIAL QUOTES

Offerors are requested to provide detailed pricing and hardware/software configurations and maintenance for a range of balanced HPC systems (See paragraph 7, Attachment 1) that meet or exceed the DoD Standard Performance Requirement (SPR) as identified in the benchmarking instructions on the HPCMP website (http://hpcmo.hpc.mil). Pricing should include alternatives that include solutions providing one to approximately four times the SPR for the vendor's solutions up to an approximate $20 million price point. The HPCMP expects to purchase about $40 million worth of systems and other support infrastructure items for the four MSRCs. ARL and NAVO MSRCs may each procure systems in the $10-20 million price range, and ASC and ERDC MSRCs may each procure systems in the $0-5 million price range. In addition, systems may be purchased for distributed centers in the $0-9 million price range.

**BENCHMARK DATA:** As a part of the response to this RFQ, the DoD HPCMP is seeking benchmark performance data for a set of runs which will be used as a part of the analysis process for a procurement to address the non-real time HPC requirements for its user base of scientists and engineers across the HPCMP MSRCs.

**REQUIRED DATE FOR RESPONSES TO RFQ AND RECEIPT OF BENCHMARK DATA:** All responses and benchmark data must be received by COB 25 Aug 2003 at the DoD High Performance Computing Modernization Program Office, ATTN: Stephanie Bell , 1010 N. Glebe Road, Suite 510, Arlington, VA 22201. Please provide a soft copy and three hard copies of the response to the RFQ. Soft copies of the response and the benchmark data shall be provided electronically to john.mayes@gsa.gov. In addition, copies of the benchmark data are to be provided by COB 25 Aug 2003 to the following two addresses:

Instrumental Inc
Attn: Kim Payne
2748 E 82nd St
Bloomington, MN 55425-1365
(952) 345-2822

William A. Ward Jr.
c/o Ms. Daffney Wells
Computer Sciences Corp
3530 Manor Drive, Suite 4
Vicksburg, MS 39180
(601) 634-2512

## GENERAL INFORMATION

1. Characterization of Requirements

a. A survey of users has identified FY 2004 non-real-time HPC user requirements totaling approximately 133 teraflops-years. The HPCMP is seeking additional HPC systems to more effectively address these requirements.

b. Our assessment of a particular platform's potential to satisfy DoD requirements will be in two categories: performance, usability. Weighting among these categories is part of the evaluation process and is not available to vendors.

c. Performance will be determined from the results of the benchmark suite. When combined with price, price/performance is determined. The benchmark suite has two components, synthetics and applications. Synthetic benchmarks measure a machine's fundamental capabilities and hence illustrate potential performance enhancements or bottlenecks. The application benchmarks have been drawn from computational technology areas (CTAs) with largest usage and requirements among HPCMP users and thus closely represent the HPCMP workload. We request that each Offeror provide a complete response to the benchmarking cases. The overall goal of TI-04 is to provide a program-wide capability that addresses the entirety of the HPCMP's requirements. This program-wide solution may well consist of several systems of varying architecture, each addressing portions of DoD's overall requirements. Thus, if offerors cannot provide a complete response to the benchmarking cases, they are encouraged to submit results to as large a subset of these cases as possible.

d. Usability criteria will be concerned with issues related to ease of use, functionality for the end user as well as for MSRC environments. This includes but is not limited to the availability of key commercial software packages, system utilities, and system characteristics that facilitate integration, operation, maintenance and upgrades Additional considerations will include past performance in fielding HPC systems of the proposed size and type, and maturity of the proposed HPC technology. Presentations will be conducted in the HPCMP Office with each offeror during the week of 11-15 Aug 03 to gather information to evaluate usability factors.

e. HPC systems delivered in response to this solicitation are required to support IPv4 and IPv6 dual stack functionality.

f. Offerors are advised that before a contract can be awarded as part of Phase II of this acquisition, they will be required to provide evidence that they have initiated the process of obtaining Information Assurance certifications of the operating system(s) offered in response to this solicitation. To assist with better understanding of this requirement the following URL pointers are offered:

http://niap.nist.gov/cc-scheme/nstissp11_FactSheet.pdf

http://niap.nist.gov/cc-scheme/nstissp_11.pdf

and

http://www.commoncriteria.org/ccc/protection_profiles/ppinfo.jsp?id=4&status=Certified

The HPCMP has identified the EAL 3; CAPP_v1.d protection profile applicable for the operating systems to be deployed in the unclassified environments and is considering the EAL 4+ Single-Level Operating Systems in Medium Robustness Environments PP, PP_MLOSPP-MR_V1.22 protection profile as applicable for systems to be deployed in the classified environments. The EAL 4+ protection profile is still under consideration and if determined not applicable, the classified environments will require the same EAL as the unclassified environments; i.e. EAL 3. Once this is resolved, an amendment will be posted to the RFQ clarifying the requirement.

g. **Non-Government advisors**. Offerors are advised that the following contractors will participate as non-Government advisors in the evaluation of proposals and are limited to a specific set of employees. These advisors will be authorized access to only those portions of the proposal data and discussion items that are necessary to enable them to provide specific advice on specialized matters or on particular problems. Any objection to disclose information to these non-Government advisors shall be provided in writing before the date set for receipt of proposals and shall include a detailed statement for the basis of the objection.

1. User Technology Associates
2. Instrumental, Inc.
3. Computer Sciences Corporation
4. Lockheed Martin Corporation
5. Greentree Associates

2. Factors to consider preparing quotes in response to the RFQs

a. The HPCMP will analyze the relative raw performance and price/performance of systems, along with usability information provided in response to the initial RFQ to determine the candidate systems to be acquired and deployed at multiple MSRCs. The HPCMP will request final RFQs from some or all of the offerors responding to the initial RFQ based on this analysis.

b. The quote provided in response to the final RFQ should include the total life cycle costs for the proposed system(s). Assume a 42-month operational life for proposed systems**. Due to budget constraints, the HPCMP has approximately one half of one percent of acquisition cost per month, over the 42-month life cycle available to purchase maintenance. Offerors should seriously consider this when preparing their response to both the initial and final RFQ.** Offeror quotes should be structured as a year 1 price and each successive year as an option. Also provide a monthly maintenance cost for any coverage after the 42 month period. For each system proposed in the quote, provide pricing as follows:

| Item | 0-12mo | 13-24mo | 25-36mo | 37-42mo | Monthly |
|---|---|---|---|---|---|
| System | $W | | | | |
| Maintenance (24x7) | $X | $Y | $Z | $A | $ |
| Other support* | $__ | $__ | $__ | $__ | |
| Total | $__ | $__ | $__ | $__ | |

**Other support costs could be operating system and other software, system specific support equipment, unique personnel, and any other items required to provide a balanced HPC system. These costs should be footnoted and explained.*
*Maintenance pricing offered under this contract may be required to extended to in-place HPC contractors*

c. The benchmarks are structured to address a range of target configurations. Due to hardware availability constraints or other considerations, offerors may respond with estimates of performance provided such estimates are guaranteed on delivered hardware, although at least one actual timing must be provided for each benchmark on the offered or a closely related system. In response to the final RFQ, selected offerors will be required to clearly explain how performance on the benchmarked configuration is extended to estimated performance of the configuration proposed. These performance projections must be expressed in terms of guaranteed benchmark performance on the delivered configuration. Again, the offeror should explain their projected efficiencies based on scalability and other factors. In response to the final RFQ, bidders will be required to guarantee benchmark performances on a "fully loaded" system.

d. Delivery of proposed systems is generally expected to occur approximately 30 June 2004. If the system proposed in the final quote is not delivered on time, the Government's consideration will be four percent of the system acquisition cost price per month (pro-rata to a maximum of 24%) until the system(s) is delivered.

e. The Government will be partnering with the contractors supporting the MSRCs throughout this process and those contactors will participate in the final integration. Pricing requested under this initial RFQ will be used to scope TI-04 purchasing options as described above. Responses to any follow-up requests for quotations will be considered best and final pricing to the Government and will be used to make final purchasing decisions. The Government will choose the systems to be purchased and allocate procurement resources based on best and final prices.

f. The offeror is required to meet the performance guarantees at the completion of the required ELT and capability testing. ELT shall commence within 90 days of delivery. If the guarantees are not met within 90 days of commencement of ELT, the Government may reject the system. Requirements for ELT and capability testing will be provided in the final RFQ.

g. The offeror is advised that a high level of system availability (97% minimum) and a guaranteed not-to-exceed number of operational interrupts per month will be required.

h. The Acceptance Test Plan and the Capability test are expected to be developed without impact to the resources of the MSRC where the system is being installed, however the local contracting officer's technical representative (COTR) should be consulted concerning any questions the offeror may have. All correspondence relating to these documents should be addressed to the GSA Contracting Officer.

i. In addition to the prices quoted, describe and quantify any other innovative pricing (including trade-ins.

j. General terms and conditions are as listed in the basic GSA Schedule contract. Each document reflects a further refinement of the Government's requirements. Should a conflict in interpretation arise between those documents and this document, the order of priority is this document, and then the basic GSA Schedule contract.

# ATTACHMENT 1

## TERMS AND CONDITIONS

**NOTE: Attachments 1,2 and 3, Terms and Conditions, Acceptance Testing, and Warranty and Maintenance generally reflect the Program's expectations, but are draft documents and may be changed when the second phase of this RFQ is released.**

1. General terms and conditions are as listed in the basic GSA Schedule 70 Contract. This document reflects a further refinement of the Government's requirements. Should a conflict in interpretation arise with this document, the order of priority is this document and then the basic GSA contract.

2. The Government is seeking independently priced quotes for the options listed in the body of the RFQ.

For each option listed in the body of the RFQ, provide the following information:

- An overview of the system configurations included in that option, including at least the number of processors, memory configuration, disk configuration, network interfaces, and any major vendor and third-party software provided with the system. Where trade-ins are involved, the system configuration that is being traded in should be described to the same level of detail, and the MSRC where the trade-in is currently located identified.

For each system proposed as part of your response, provide the following information only once, even though a system may be present in multiple options:

- Execution times for data sets provided by the HPCMP and selected by the offeror in accordance with guidance provided in paragraph 9 below.
- Complete Bill of Material (BOM) for the proposed configuration including all support equipment and software hardware.
- System facility requirements including realistic estimates for power consumption, ambient/liquid cooling requirements, intake and exhaust air flows, wiring/cabling considerations, floor loading, and floor/underfloor space requirement for all proposed equipment.
- Configuration drawings.

Balanced systems are discussed in paragraph 7 below. Should any items required for a fully functional system not be included in the BOM for a system, such items will be included in the final system configuration at no additional cost to the Government.

3. Should a quoted option be selected and purchased, the offeror will be responsible for delivery of the systems in that option to the designated HPC Centers, and for removal of any systems identified in that option for trade-in from the HPC Centers where presently located. All shipping costs, for all systems involved, and the cost of preparing the trade-in system for shipping, are the responsibility of the offeror and are to be included as a part of the price for that option in the quote. Any dependencies between or among the timing of delivery of the new system(s), timing of de-installation of the trade-in systems, and the effect (if any) on the pricing

of a quoted option if the timing of the de-installation of the trade-in systems cannot be met by the Government are to be included in the quote.

4. Use of trade-ins and upgrades in the quote are allowed. HPCMP user requirements are being addressed at the program, rather than the specific HPC Center level; therefore, quotes may include options of trade-ins of one HPC Center's equipment for purchase of systems to be delivered at another HPC Center. Offerors are not limited to proposing the presently installed HPC systems of their own manufacture as trade-ins.

5. Effectiveness Level Testing and Capability Testing completion are the responsibility of the offeror (with Government oversight). The requirements for the ELT and CT are described in Attachment 2. A Capability Test Plan must be provided to the Government subsequent to receipt of an order as described in Attachment 2.

6. System maintenance is to be provided as shown in Attachment 3. Warranty period (if any) shall not commence until successful completion of Acceptance Testing as described in Attachment 2. Warranty terms are discussed in Attachment 3. Maintenance charges will commence upon expiration of the Warranty period (if any), or upon successful completion of the Acceptance Testing (if no warranty is proposed).

7. Offerors must propose balanced HPC systems. Balanced HPC systems are considered to be those with the appropriate combinations of processors, memory, I/O, internal and networking communication, and on-line storage that fully satisfy both system and user needs – all permitting the system to sustain processing operations at high levels of system utilization for the DoD HPCMP workload as described in the initial RFQ and characterized by the previously distributed benchmark suite. Balanced systems can generally be considered as those having features and configurations similar to the larger HPC systems currently installed at the MSRCs. If an existing system is being upgraded or expanded, the resulting system should be configured as a balanced system. Maintenance costs and all other costs to provide an operational system should be included. If a warranty is included, the duration, terms and conditions of the warranty should be stated. Additional maintenance and warranty terms and conditions are shown as Attachment 3.

8. Delivery of proposed systems is generally expected to occur prior to 30 June 2004. If a proposed system is not fully delivered within the interval after receipt of order specified in the proposal, the Government's consideration will be four (4) percent of the system acquisition cost (or other consideration at the sole discretion of the Government) per month (pro-rata to a maximum of 24%) until the system is fully delivered.

A phased delivery (an interim system providing a limited capability delivered prior to 30 June 2004 and a final system providing an enhanced capability to be delivered within a offeror-specified interval not to exceed six months after delivery of the interim system) may be proposed. Such a proposed phased delivery must result in at least a 20% decrease in the benchmark completion times guaranteed in the proposal between the interim system and the final system, or increased functionality, or better maintainability, or a larger total system (or some subset of those options at the sole discretion of the Government). The guaranteed benchmark execution times for the interim system and the guaranteed decreases in those times for the final system must be included in the proposal when a phased delivery is proposed.

Should the offeror propose a phased delivery, the proposal should address how ELT and Capability Tests would be accomplished and how payment terms, maintenance pricing, and any warranty periods would be modified consistent with the additional risks the Government would assume. The pricing quote for an option containing a phased delivery must include the cost of both the interim and final systems in the initial system acquisition price.

9. Guaranteed benchmark execution times must be provided in the proposal for each system proposed, and should be stated in terms of maximum wall clock execution times for completion of each of the benchmark programs, when executed in dedicated mode. These are the maximum times for completion that the offeror guarantees will be observed for a proposed system when they are executed on the system after installation at the MSRC. These benchmark programs are a subset of the benchmark suite to be provided in conjunction with the initial RFQ issued by GSA on 27 June 2003. In addition to the application and synthetic benchmark code timings provided in response to the first RFQ (and any updates to these provided in response to this RFQ), the vendor will be required to guarantee certain application benchmark times on a loaded system. These guaranteed times on a loaded system will be verified as part of the acceptance tests. These loaded system tests will be run with a synthetic load run along with the benchmark. Details will be provided in the Phase II RFQ.

10. Each provided system is required to meet the benchmark execution times guaranteed in the proposal as a part of the required Capability Test after installation of the system. (The provided system must be configured for production use at the site when running the Capability Test.) If a system is unable to do so (or in the case of a phased delivery, if either the initial or final system is unable to meet the respective benchmark execution times), the Government may reject the system and the offeror will be responsible for the cost of restoring the MSRCs facilities and computers to their pre-installation configuration. Should additional equipment be required to meet the guaranteed benchmark execution times, this additional equipment will be provided by the offeror at no cost to the Government and included under the related maintenance contract at no additional life cycle cost to the Government.

11. For each system provided, expanded, or upgraded as part of any option in the proposal, the facility requirements (space, power, cooling, electrical connections, and the like) must be described. This description should be in sufficient detail to permit the Government to price any required facilities modifications and enable installation of the system at the MSRC. Information to assist in configuring systems contained in the proposal to ensure interoperability with the existing networks at each MSRC is provided in Attachment 4.

12. Current Technology Substitutions/Additions. The Contractor, upon commercial announcement of new components that can be technically and economically substituted for, or added to, items identified in the Contractor's proposal, shall offer said items for addition or substitution. These item(s) may be accepted at the option of the Government, provided at least equivalent performance with economic benefits or significantly enhanced performance is achieved.

13. Warranty Provisions.

a. Any provided warranty shall commence upon the first day after the successful completion of acceptance testing as described in Attachment 2. Any maintenance (to include parts) performed prior to this period shall be furnished at no cost to the Government.

b. Defective parts which contain data and cannot be sanitized to the satisfaction of the Government which are replaced during the warranty period shall, at the sole discretion of the Government, remain the property of the Government. The Government shall incur no additional costs related to retention of such parts. All other defective parts which are replaced during the warranty period shall become the property of the Contractor.

c. Prior to the expiration of the warranty period, whenever equipment is shipped for mechanical replacement purposes, the Contractor shall bear all costs, including, but not limited to, costs of packing, transportation, rigging, drayage and insurance.

d. The warranty shall not apply to maintenance required due to the fault or negligence of the Government.

14. Risk of Loss Or Damage.

The Government is relieved from all risks of loss or damage to purchased equipment during periods of transportation, installation, and prior to completion of the Effectiveness Level Test, except when loss or damage is due to the negligence of the Government.

15. Maintenance Credits.

A maintenance credit of 100% will be taken when the system availability falls below the guaranteed level (minimum acceptable is 97%), or the number of operational interrupts per month exceeds that guaranteed by the offeror. See attachments 2 and 3 for a full description of the maintenance terms.

16. Section 508 Compliance.

All information technology products acquired or developed by a federal agency after June 25, 2001, must be compatible with accessories that permit people with disabilities to use that equipment. While agencies do not have to install assistive devices and technology in their offices until an employee with disabilities needs it, any electronic and information technology (EIT) equipment purchased after June 25, 2001, must meet specific standards so assistive devices can be attached if needed. Therefore, all EIT equipment delivered under this order, must meet the applicable accessibility standards at 36 CFR 1194. 36 CFR 1194 implements Section 508 of the Rehabilitation Act of 1973, as amended, and is viewable at http://www.section508.gov/accessible.html (FAR Part 39.2)

17. Additional Clauses – Incorporated by Reference

All FAR Clauses from the GSA Schedule are incorporated into this RFQ. The following additional FAR and DFAR Clauses are incorporated by reference:

**FAR**:

| | | |
|---|---|---|
| 52.227-14 | Rights in Data – General, Alternates I, II, III, IV and V | (JUNE 1987) |

**DFAR**:

| | | |
|---|---|---|
| 252.227-7015 | Technical Data – Commercial Items | (NOV 1995) |
| 252.227-7019 | Validation of Asserted Restrictions – Computer Software | (JUNE 1995) |

| | | |
|---|---|---|
| 252.227-7025 | Limitations On The Use Or Disclosure Of Government-Furnished Information Marked With Restrictive Legends | (JUNE 1995) |
| 252.227-7030 | Technical Data – Withholding of Payment | (MAR 2000) |
| 252.227-7034 | Patents – Subcontracts | (APR 1984) |
| 252.227-7037 | Validation Of Restrictive Markings On Technical Data | (SEPT 1999) |

# ATTACHMENT 2

## ACCEPTANCE TESTING

**NOTE: Attachments 1,2 and 3, Terms and Conditions, Acceptance Testing, and Warranty and Maintenance generally reflect the Program's expectations, but are draft documents and may be changed when the second phase of this RFQ is released.**

1. General.
As part of the acceptance process after installation of a system, the offeror will be required to complete two acceptance tests. The offeror shall provide an Acceptance Test Plan which describes how these tests will be conducted. This plan will be provided at least 30 days prior to the offeror's intent to begin testing. The Effectiveness Level Test (ELT), as described in paragraph 2 below, will be the first test run by the Government or the Government's agent upon installation of a system. The Capability test (CT), as described in paragraph 3, shall begin after commencement of the ELT and finish prior to conclusion of the ELT. Acceptance of equipment by the Government is described in Sections 6 and 7 below. **NOTE: The requirement for the offeror to develop acceptance test plans is under discussion. The Government may elect to develop the Acceptance Test Plan. This will be addressed in the Phase II RFQ.**

The purpose of the ELT is to demonstrate that the system being purchased by the Government has been delivered in full and is reliable in accordance with the effectiveness level requirement; i.e. runs for thirty (30) consecutive days at or above the offeror's proposed level of reliability. The purpose of the CT is two-fold. First, to demonstrate that all components of a system can function as an inter-working system and second, to verify that the inter-working system can produce the benchmark execution times guaranteed in the proposal. In general ELT lasts thirty (30) days (unless an extension is required to achieve the required effectiveness level) and the CT can last up to 5 working days.

Consistent with the above-specified purposes for the ELT and CT, the Government desires to minimize, where appropriate and possible, the length of time between delivery of the proposed system and placing it into operational use within the MSRC. Accordingly, offerors will permit access to and use of the system by designated MSRC personnel prior to and during the ELT. It is recognized that such access and use needs to be explicitly approved by and coordinated with the offeror in advance of such access or use.

2. Effectiveness Level Testing.
For the purpose of the Effectiveness Level Test, equipment and system software shall be considered one system.

a. Starting ELT. The formal Effectiveness Level Test shall not begin until the offeror has certified in writing to the Government or the Government's agent that all offeror-proposed

hardware and software have been fully installed are fully functional, and that the system is ready to begin ELT. The Government shall have a maximum of five (5) working days after the plan is approved by the HPCMP to approve start of the ELT. For the system to be ready for ELT, the offeror shall be responsible for:

1. Assuring all hardware and software are installed and configured to support a production environment (with assistance from the site staff as appropriate).
2. All software required to successfully run the HPCMP benchmarks
3. Successful completion of HPC Linpack using all proposed computational nodes with the results provided to the Government.

Prior to ELT, the Government will provide:
Site preparation including power, cooling, and networking cabling

During ELT:
The offeror will allow the Government to install 3rd party software.

b. Performance Period. The performance period for ELT shall begin at a time mutually agreed upon by the offeror and the Government after receipt of the offeror's written certification, completion of the HPC Linpack execution, and the Government's concurrence with the offeror's request to begin ELT. The performance period shall end for a system when the system and each piece of equipment contained therein, has met the Effectiveness Level and has experienced a number of Operational Interruptions less than or equal to the proposed maximum number of Operational Interrupts for the preceding thirty (30) consecutive days. If the system, or any piece of equipment contained therein, does not meet the Effectiveness Level or experiences a number of operational interrupts higher than proposed during the initial thirty (30) consecutive days, the performance period for that system may be extended on a day-by-day basis. However, if the required extension is more than ninety (90) consecutive days after commencement of ELT for the system configuration proposed (either the only ELT for a system, or the second ELT for a final system in a phased delivery, see paragraph 8 of Attachment 1of this RFQ), the Government may unilaterally reject the system being tested. The offeror will be responsible for the cost of restoring the MSRCs facilities and computers to their pre-installation configuration.

c. Effectiveness Level Calculation. For the purpose of the Effectiveness Level Test, the effectiveness level (EL) shall be computed for each offeror-furnished system as follows:

$$EL = 100 * \frac{\text{Operational Use Time (hours)}}{\text{Scheduled Use Time (hours)}}$$

Only the integer portion of the above computed EL will be retained. Existing equipment will be subject to effectiveness level testing only when offeror-furnished additions or alterations are integral to the equipment and it can not be easily determined that the downtime is due to failure of the existing equipment. Otherwise, only the offeror-furnished system shall be subject to effectiveness level testing.

The furnished system(s) and each piece of equipment therein shall operate for a period of thirty (30) consecutive days during the Performance Period of the ELT at a minimum Effectiveness Level of 97%, unless the offeror proposes to meet a higher Effectiveness Level. In that case, the system must meet or exceed the proposed effectiveness level. A system will be considered down

for an entire hour if it is down during any portion of that hour. In the Effectiveness Level computation, time shall be measured in 60 minute intervals.

d. Operational Interrupt: For the purposes of ELT, an Operational Interrupt is defined as the failure of one or more system components, including software, which result in the failure of a user job or could result in the failure of the user job (includes failures of a node of nodes and all associated hardware and software that is executing a user job or is available to execute a user job (e.g. an idle computational node).

e. Operational Use Time: For the purposes of Effectiveness Level Testing, a system is considered Operationally Usable if it is capable of at least running the proposed number of instantiations of the six application benchmark codes described on the HPCMP website (http://hpcmo.hpc.mil) when submitted using the installed queuing software by a remote interactive login which has no system level privileges. Operational Use Time are those hours during the preceding thirty (30) consecutive days when the offeror-furnished system is Operationally Usable during an entire clock hour. (The minimum time segment which may be considered operationally usable is four (4) hours.

f. Scheduled Use Time: For the purpose of the Effectiveness Level Test, Scheduled Use Time is 720 hours less Excusable Delays during the preceding thirty (30) consecutive days.

g. Excusable Delays. In addition to the Excusable Delays set forth in FAR Clause 52.212-4, the following periods of time are Excusable Delays:
1) Periods during which the system is not performing due to planned outages which have been approved and scheduled in advance by the Government's COTR or other designated Government representative.
Periods during which the system is not performing due to Government-attributable causes, such as loss of Government-provided power.

h. Delay of Start of Performance Period. Should it be necessary, the Government may delay the start of the performance period (after approval of the ELT test plan), but such delay will not exceed five (5) working days. Thus, the performance period shall start no later than the sixth (6th) working day after the system is installed and ready for the ELT in accordance with paragraph 2a. above.

i. Additional ELT Requirements
1) Added System Elements. Systems or single hardware items which are to be added, substituted, or installed by the offeror, may at the option of the Government, be subject to a new thirty (30) day Performance Period which is independent of other system elements.
2) Daily Record: The Government or designated representative will maintain appropriate daily records of system and equipment effectiveness levels.
3) Access to and Use of System. Where possible, the offeror is requested to permit designated Government and contractor personnel access to and use of the system before and during the ELT period, in order to perform site-specific integration activities (examples would include job scheduler configuration, and application software installation) and to exercise system functionality that will ultimately be available for use by the HPCMP users when the system is placed into operation.
4) System Utilization Requirement. The system must achieve a minimum utilization of 50% of the scheduled CPU hours (scheduled use time* number of computational CPUs * 0.5). The CPU

hours utilized will be determined from either system activity reporter (SAR) or system accounting records. The ELT workload proposed to meet this minimum utilization requirement must be approved by the Government .

3. Capability Testing.

a. Starting Capability Testing. The Capability Testing is conducted during the Effectiveness Level Tests. The offeror is responsible for submitting a Capability Test Plan to the Government. The Test Plan shall include the testing of the integrated system including the benchmark performance tests. The Government typically has an independent organization witness the Capability Test, therefore the offeror needs to notify the Government or its designated representative in writing that the system is ready to begin the CT at least 14 calendar days prior to that event. The Government shall have a maximum of five (5) working days to approve start of CT. A sample of the types of tests that are typically conducted as part of the CT Plan are as follows:

*1) Network Capabilities:*

a). Demonstrate access to a computer system outside of the domain local to the MSRC but on DREN, kftp, and ktelnet from the system under test.

b) Demonstrate access from a computer system outside of the domain local to the MSRC but on DREN, by using a Government-provided account to kftp and ktelnet to the system under test.

c) Demonstrate access to other systems within the MSRC, by using kftp and ktelnet in a pair wise manner from and to the system under test and Government specified systems at the MSRC.

*2) Installed System Capabilities:*

a). Demonstrate that the aggregate data transfer rate across all disk subsystems is at least xxx MByte/sec. XXX = 100 MB/s + 150 MB/s*(system peak FLOPS/1 teraFLOPS).

b) Demonstrate that XX batch jobs can be simultaneously active. . XX=0.95*(the number of computational processors which can be individually scheduled). If the number which can be individually scheduled does not meet this goal, the offeror shall provide the reasons(s) why this is the case.

c) Demonstrate that the system can be brought to an orderly halt while preserving the file systems, batch job queues, and rerunnable open batch jobs

d) Demonstrate in a pair wise manner that files can be exchanged among the system under test and Government specified systems at the MSRC without loss of information content.

e) Demonstrate that the compilers (if any) supplied with the system supports all parallel programming models supported by the system.

f) Demonstrate that a program with at least one module from each compiler and assembler provided with the system can be linked in such a way that all modules in the program successfully execute.

g) Demonstrate that the compilers (if any) provided for that system supports a memory layout mechanism which work across multiple CPUs.

h) Demonstrate that the compilers (if any) provided for that system supports a mechanism which partitions work across multiple CPUs. (This may be the same demonstration as the previous one).

i) Demonstrate that the system can be restarted after a crash. Demonstrate the extent to which file systems, batch job queues, and rerunnable open batch jobs are preserved in such a situation. (Complete preservation is not expected nor required.)

j). Demonstrate that each software development utility provided with the system will execute with a simple test case or input program.

4. Failure to Successfully Complete Capability Test. In the event that the installed system does not successfully complete the CT, within five (5) working days, the offeror and/or the Government or the Government's agent shall determine the reason for failure. After correcting the failure in order to achieve a satisfactory result, which may require adding, substituting, or installing requisite hardware, software and performing services at no extra charge to the Government, the Capability Test shall be repeated.

5. Execution of Guaranteed Benchmark Times. As part of the Capability Test described above, the Government and/or the Government's designated representatives will witness the offeror execute all benchmark programs whose execution times were guaranteed in the proposal for the installed system(s).

*a. Benchmark Required Performance:*

1) All benchmark programs shall terminate normally, and produce output that satisfies the correctness criteria for that benchmark program. Execution times for the benchmark program and data set combinations applicable to the system under test must meet or be less than the times contained in the offeror's proposal.

2) In the event the required normal termination(s) and correctness criteria satisfaction is (are) not obtained, or the benchmark programs fail to meet or beat the guaranteed execution times during the Capability Test, the system will have failed to successfully complete the CT, and the offeror shall proceed as described in paragraph 4 above.

3) Benchmark program/data set combinations applicable to demonstration of the guaranteed execution times for both the interim system and the final system in a phased delivery must be rerun on the final system completing a phased delivery. Both sets of benchmark program/data set combinations must demonstrate the guaranteed execution times as contained in the proposal. In the event that such execution times are not demonstrated, the system will have failed to successfully complete the CT, and the offeror shall proceed as described in paragraph 4 above.

*b. Files and Data Sets:*

The benchmark programs and data sets will be the same ones previously provided by the HPCMP in the initial RFQ.

6. Acceptance.

a. The offeror is responsible for the preparation and submission of DD Form 250, Material Inspection and Receiving Report. Formal acceptance of equipment by the Government's Contracting Officer or designated representative, upon successful completion of the Effectiveness Level Test and Government inspection, as specified in the preceding paragraphs, will be acknowledged on the face of the required Material Inspection and Receiving Report, DD Form 250. No payment shall be made on delivered hardware or software without formal acceptance being made by a duly authorized representative of the Government acknowledging such acceptance by their signature on the face of the above referenced Material Inspection and Receiving Report, DD Form 250.

b. Upon formal acceptance of equipment by the Government as defined above, the offeror shall be entitled to receive 75% of the price of the accepted equipment. The balance of that price shall be paid after the system has been placed in production operation within the HPCMP Center environment for a minimum of 30 days at the proposed effectiveness level.
c. In a phased delivery, each phase of the system will be accepted separately.

7. Acceptance of Additional Equipment.
Any equipment or software added, substituted, or installed to fulfill the performance guarantees contained in the offeror's proposal shall be subject to the same acceptance criteria of this attachment.

# ATTACHMENT 3

## WARRANTY AND MAINTENANCE

**NOTE: Attachments 1,2 and 3, Terms and Conditions, Acceptance Testing, and Warranty and Maintenance generally reflect the Program's expectations, but are draft documents and may be changed when the second phase of this RFQ is released.**

1. Defective Parts Retention.
Once installed in a system at an MSRC, defective parts (e.g. magnetic media, semiconductor devices, etc.) that contain any data will be retained by the Government. The Government, at its option, may permit degaussing and/or declassification of such devices in accordance with approved, verifiable procedures for return to and re-use/disposal by the offeror. However, the Government reserves the right to retain these devices permanently or to destroy them, regardless of warranty or maintenance coverage for these devices. The Government shall incur no additional costs related to retention of such parts.

2. Warranty.
a. Any provided warranty shall commence on the next day after successful completion of acceptance testing. Any maintenance (to include parts) performed prior to this date shall be furnished at no cost to the Government.
b. Prior to the expiration of the warranty period, whenever equipment is shipped for mechanical replacement purposes, the offeror shall bear all costs, including, but not limited to, costs of packing, transportation, rigging, drayage and insurance.
c. The warranty shall not apply to maintenance required due to the fault or negligence of the Government or acts of God/nature.
d. The effectiveness level of each system during the warranty period shall be computed separately, on a month by month basis, using the formula and definitions for effectiveness level (EL) in paragraph 2c. of Attachment 2.
e. The offeror shall maintain equipment provided in response to this proposal during the warranty period at a monthly effectiveness level of 97% (or higher if proposed by the offeror and a minimum number of operational interrupts per month consistent with guarantees offered by the offeror. If the monthly effectiveness level for a system/equipment drops below those levels, or if the number of operational interrupts exceeds the maximum guaranteed, the offeror shall grant the Government a consideration in the form of 100% of one month's (post warranty) maintenance charges. Note that the offeror needs to prepare a clear definition of the incident count and what it applies to.
f. If the offeror provides warranty coverage which doesn't fully meet the requirements of the HPCM program, a cost to meet that coverage during the warranty period should be included in the response to the RFQ as shown in paragraph 2b of General Information above.

3. Hardware Maintenance.

a. On an as-required basis, the offeror shall provide remedial and preventive hardware maintenance for all equipment provided in response to the proposal, and for systems upgraded or expanded in response to the proposal.
b. Offeror maintenance personnel shall interact with designated Government and the Government's agent Points of Contact to facilitate equipment maintenance.
c. The offeror shall provide all labor, documentation, spare and repair parts, maintenance supplies, tools, diagnostics, and test equipment necessary to promptly and efficiently ensure that the equipment is restored to such a state that it is in nominal operating condition.
d. The offeror shall attempt to minimize the risk of loss of Government data while performing remedial and preventive hardware maintenance.
e. Offerors must notify the Government of any requirement for on-site storage of parts. Government will assume no requirement for on-site parts storage.

4. Remedial Maintenance.

Remedial maintenance shall be performed in accordance with the terms of the proposal. The Principal Period of Maintenance (PPM) shall be 24 hours per day, seven days a week, including holidays. Remedial maintenance shall be required when the Government's designated COTR, the Government's agent, or other authorized personnel, makes an entry in the System Maintenance Event Log for the MSRC recording that the system is not available for use, and notifies the offeror in accordance with previously established and mutually agreed to procedures.
"Not available for use" includes degradation in system performance or from conditions where full system functionality is not being provided. Examples would include, but not be limited to, inoperable processors, memory, on-line storage, network interfaces, or input/output paths/subsystems. System functionality includes all system capabilities and operating characteristics that are normally available for use by the HPCMP users.
When remedial hardware maintenance is required, the response time shall be within two hours. Response time begins at the time of an entry in the System Maintenance Event Log and proceeds until corrective actions are initiated by the offeror. Copies of the System Maintenance Event Log shall be provided to the Government's COTR upon request, and may be used by the Government to establish the times used in computing the monthly effectiveness level.
1) The effectiveness level of each system shall be computed separately, on a month by month basis, using the formula and definitions for effectiveness level (EL) of paragraph 2c. of Attachment 2.
2) The offeror shall maintain equipment provided in response to this proposal during the post-warranty period at a monthly effectiveness level of 97% (or higher if proposed by the offeror and a minimum number of operational interrupts per month consistent with guarantees offered by the offeror. If the monthly effectiveness level for a system/equipment drops below those levels, or if the number of operational interrupts exceeds the maximum guaranteed, the offeror shall grant the Government a consideration in the form of 100% of one month's (post warranty) maintenance charges.

5. Preventive Maintenance.

1) The offeror shall work with Government COTR or designated representative to establish a mutually agreeable schedule for PM. Any time for which the system is not operationally usable during a PM period will be deducted from the operational use time for the purposes of the effectiveness level calculation and will be counted as an operational interrupt at the discretion of the Government. See Attachment 2 for additional clarification of operational use time and effectiveness level.
2) The Government requires that all manufacturer-sponsored Engineering Changes (ECs) issued prior to acceptance be incorporated into any equipment provided by the offeror. After the date of acceptance, all future ECs and changes shall be offered to the Government by the offeror within 60 days of release by the manufacturer for production use. Those ECs and changes required to correct safety hazards shall be offered to the Government within one day's notification to the offeror by the manufacturer that such an EC or change is available for production use. It is understood that a rejected EC may have to be accepted at a later date if it is required as a prerequisite to a future accepted EC. The offeror shall notify the Government of all ECs prior to commencing installation of the ECs. All manufacturer-sponsored ECs, except changes required to correct safety hazards, shall be subject to approval by the Government's COTR or designated representative prior to commencing the equipment modification. Notification shall include a description of the EC or change, the equipment it applies to, and a recommendation as to whether or not it should be installed. ECs and changes required to correct safety hazards shall be obtained from the manufacturer and installed in a timely manner by the offeror during periods of preventive maintenance.

6. Software Maintenance.

The offeror shall provide on-site software maintenance in accordance with previously established and mutually agreed to proceduresfor all software provided by the offeror.
a. The offeror shall perform the initial software installation and configuration of all offeror provided software.
b. The offeror shall maintain compliance with all hardware and other software specifications with any new software releases installed.
c. The offeror shall obtain from the manufacturer or developer all new releases of off-the-shelf software originally provided by the offeror, including subroutine libraries, together with installation instructions and associated documentation. These releases shall be offered to the Government by the offeror within 60 days of availability of such releases for production use. The offeror shall install the new release, dependent on the prior installation of any requisite hardware and subject to approval by the Government's COTR or designated representative prior to installation. The term "releases" shall be considered to include corrections (AKA "bug fixes"), revisions, updates, extensions, improvements, new versions, and new library language bindings for any compilers originally provided by the offeror. New releases shall contain all previous fixes. New releases shall be tested prior to release for general use, to ensure successful implementation when released. Such testing shall be coordinated with the Government's integrating contractor and performed at such times as to provide minimal user impact.
d. The offeror shall notify the Government's COTR or designated representative of all security alerts that apply to operating systems and associated software and utilities provided or maintained by the offeror, within one day of their release. Any resulting change to operating systems and associated software and utilities provided or maintained by the offeror shall be

submitted to the Government's COTR or designated representative for approval, with installation instructions and associated documentation.

e. The offeror shall attempt to minimize the risk of loss of Government data while performing software maintenance.

# ATTACHMENT 4

## MSRC NETWORKING INFRASTRUCTURES

A. Existing networking infrastructure at ARL:

For additional information on the existing infrastructure at the ARL MSRC contact Mr. Tom Crimmins, 410-278-6267, TELEFAX 410-278-8678, email tomc@arl.army.mil.

The ARL MSRC Classified networking currently uses the following technologies:

| | 10/100 E/net | ATM | GigE/net |
|---|---|---|---|
| IBM P4 | x | | x |
| SGI O3K | | | x |
| MSAS | | x | x |
| | | | |
| | | | |

The ARL MSRC Unclassified networking currently uses the following technologies:

| | 10/100 E/net | ATM | GigE/net |
|---|---|---|---|
| IBM P3 | x | | x |
| IBM P4 | | | x |
| SGI O3K | | | x |
| Linux Networx | | | x |
| MSAS | | x | x |

B. Existing networking infrastructure at ASC:

For additional information on the existing infrastructure at the ASC MSRC contact Mr. John Carter, 937-904-5150, TELEFAX 937-255-1787, email john.carter@wpafb.af.mil.

The general design approach for networking at the ASC MSRC is to support HPC systems with ATM OC-12, Gigabit Ethernet, and Fast Ethernet interfaces. The ASC MSRC is moving away from HiPPI, FDDI, ATM OC-3, and Ethernet (10 Mbps). For interoperability purposes, the current set of network vendors at the ASC MSRC is as follows:

-- Foundry Networks for Gigabit Ethernet, Fast Ethernet, and Ethernet switches
-- Marconi (Fore Systems) for ATM switches
-- Cisco Systems for routing in the core and at the border with DREN

New HPC systems destined for the ASC MSRC should support the following network protocols:

-- ATM NICs shall support Classical IP over ATM (CLIP) per RFCs 1577/2225, and

LAN Emulation (LANE)
-- Gigabit Ethernet NICs shall support "jumbo frames" of at least 9000 bytes and "standard frames" of 1500 bytes

ASC MSRC's goal is to avoid "network vendor proliferation" and to be able to easily integrate new HPC systems into its' existing environment.

C. Existing networking infrastructure at ERDC:

For additional information on the existing infrastructure at the ERDC MSRC contact Mr. Greg Rottman, 601-634-2654, TELEFAX 601-634-2774, email Greg. K. Rottman@erdc.usace.army.mil.

The general design approach for networking at the ERDC MSRC is to support HPC systems with Gigabit Ethernet for interactive access with other MSRCs and interactive user access and internal machine to machine networking. Fast Ethernet interfaces are used for administrative functions. The ERDC MSRC is currently reducing their dependency on HiPPI, FDDI, ATM (OC-3 and OC-12), and Ethernet (10Mbps). For interoperability purposes, the current set of network vendors at the ERDC MSRC include:

Foundry Networks and Cisco Systems for Gigabit Ethernet, Fast Ethernet, and Ethernet switches

Marconi (Fore Systems) for ATM switches

Cisco Systems and Juniper Networks for external routing

Responses to this RFQ should include at a minimum Gigabit Ethernet NIC(s) supporting jumbo frames of at least 9000 bytes and standard frames of 1500 bytes.

The ERDC MSRCs goal is to avoid network vendor proliferation and be able to easily integrate new HPC systems into its existing environment.

D. Existing networking infrastructure at NAVO:

For additional information on the existing infrastructure at the NAVO MSRC contact Mr. Bobby Knesel, 228-688-516, TELEFAX 228-688-4356, email rmk@navo.hpc.mil.

The internal MSRC network is built upon a resilient combination of CISCO GSR routers, Cisco 6500/4507R switching routers, Marconi/Fore ATM switches, and Essential HiPPI switches. Primary interfaces used for networking include HiPPI, OC-12 ATM, and gigabit ETHERNET. Aggregated backbone traffic is carried on IP-over-SONET (IPOS) and Gigabit Ethernet links within the MSRC.